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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/089,136

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Wolfgang Heimberg

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EXAMINER

LEVKOVICH, NATALIA A

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/089,136	Applicant(s) HEIMBERG ET AL.	
	Examiner NATALIA LEVKOVICH	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19, 21-23, 25, 27, 35, 37, 41, 43, 49 and 53-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 21-23, 25, 27, 35, 37, 41, 43, 49 and 53-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/21/2008</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/21/2008 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. .

As amended, the claim recites the segments of the reaction vessel receiving element being insulated from each other with a thermal insulator inserted in a gap, between adjacent segments. Upon further reviewing the original specification, Examiner found no support for this limitation. The specification does support non-conductive ties connecting the segments, but not thermal insulators providing insulation between the segments, as currently recited.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 19, 21-23, 25, 27, 35, 37, 41, 43, 49 and 53-56 are rejected under 35 U.S.C. 112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The amended claim 19 recites the heating / cooling devices being “actuated independently of one another to set and maintain different temperatures in two adjacent segments wherein the system provides different temperatures to the segments during a temperature cycle to optimize the parameters for PCR”. It is unclear whether or not the intended structure includes any actuating means and a controller to provide the above cited functionality. See also claims 41 and 49, with respect to controlling segment temperature.

Additionally, it is not clear what structural features would configure the reaction vessel receiving element for holding specifically a single non-conductive multi-well plate. It is also unclear whether or not electrical conductivity is meant. In reference to each heating / cooling device corresponding to “one segment”, it is unclear whether or not all the

devices are connected to the same segment, or whether “one-to-one” relationship between the devices and the segment is meant.

With respect to claim 25, it is unclear how inserting a thermal insulator into a gap between the segments, the gap being filled with air, can serve the goal of thermal decoupling of the segments, since thermal conductivity of known solid insulating materials is higher than that of the air.

In claim 54, the “residence time of at least one...temperature”, is unclear.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 19, 21-23, 25, 27, 35, 37, 41, 43, 49 and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon et al. (US 5601141) in view of Potter et al. (US 5819842).

As was shown previously, with respect to claims 19, 21-22, 35, 37, 41 and 43, Gordon discloses a modular thermo-cycler “that carries a large batch of samples through one or more predetermined temperature profiles” and comprises a base and an array of modules [‘segments’ – Ex.] mounted on the base. The modules are “substantially isolated from one another, thermally and functionally...” The module has a temperature sensor adjacent the samples, an electrical resistance heating element, and a circulating fluid heat exchanger for step cooling...The modules are preferably formed in three layers--a sample plate [‘thin-walled reaction vessel holders’-Ex, see 14a of Figure 4], a heater plate, and a cooling plate [‘devices for heating and cooling’-Ex., see elements 14 b-c of Figure 4) adjacent to a manifold... The sample plate is preferably replaceably secured at the upper surface of the module on the heating plate... The sample plate is adapted to receive a standard micro-titration plate, or other labware, in a close, heat-transmitting engagement [which may comprise recesses-Ex.]... The heater plate and cooling plate may be formed integrally [that is, as a device for heating and cooling a module / “segment”-Ex.]” - (see Abstract; Col.1, line 5; Col.2, lines 10-40). Figure 6 shows channel 46 filled with heat dissipating fluid [‘temperature equalization element’].

Although the modules of Gordon are disclosed to receive a separate plate each, rather than a single plate altogether, they are capable of supporting a single plate. It would have been also obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Gordon such that it would provide individual and independent heating / cooling of separate portions of a single micro-titer plate, in order to increase the scope of scalability and applicability of the apparatus,

and, consequently, to enhance its commercial / marketing value, the thermo cyclers configured to independently control the portions of a single plate being well known in the art. For example, Potter et al. disclose a device for “independent control of multiple samples which are in close proximity” (Abstract). The device comprises, as shown in Figures 1-3, a multi-well sample plate 10 having wells 13, the temperature within each well being independently controlled by heat controlling segments 21 of sample vessel receiving structure 20. Potter also discloses Peltier thermoelectric devices as possible heat controlling elements (Col.2, line 43).

With respect to claims 23 and 25, Gordon teaches that “the modules are spaced laterally, from one another [‘decoupled by means of air gaps’] which in combination with forming the base of the insulator, provides a good degree of thermal isolation of each module” (Col.3, lines 40-45). It would have been also within the ordinary skill of an artisan at the time the invention was made to have modified the thermal conductivity of the gaps (depending on particular goals of thermo-cycling) by filling them with materials having different thermal conductivity characteristics (including thermal insulators), in order to achieve more flexible and precise control over temperature conditions in the apparatus of Gordon.

Regarding claim 27, Gordon refers to the use of Peltier elements for heating or cooling as being well known in the art in column 1, lines 30-35.

With respect to claims 49, and 53-55, these are limitations to the process of using the device, which are not attributed patentable weight in a claim to the apparatus.

It would appear that the apparatus of Gordon et al. is capable of operating in this manner.

Referring to claim 56, Gordon teaches that a controller "regulates the electrical current and cooling fluid flows to each module in response to a signal from a temperature sensing element associated with each module"(Col.2, lines 15-20; Col.4, line 45; Col.5, line 55).

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 19 and 41 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of co-pending Application 11/470463, claim 18 of co-pending Application 11/450442, claim 18 of co-pending Application 11/651986, and claim 26 of co-pending Application 11/651985. Although the conflicting claims are not identical, they are not patentably distinct from each other.

In particular, claims 1-2 of 11/470463 are directed to a thermocycler comprising a sample block configured to receive one microtiter plate and configured to define a plurality of segments; a plurality of thermoelectric cooling devices disposed to correspond to each of the plurality of segments, wherein the devices provide heating and cooling, the thermocycler further comprising one or more temperature sensors disposed in each of the plurality of zones. Thus, all the elements of the instant claims 19 and 41 (that is, a multi-sectional reaction vessel holder having a plurality of heating / cooling elements and sensors arranged in registration with the sections) are fully encompassed in claims 1-2 of 11/470463.

With respect to claim 18 of the co-pending application 11/450442, it is drawn to a device comprising: a reaction vessel receiving element comprising a plurality of reaction vessel holders; a Peltier element configured to heat and cool the reaction vessel holders and a controller configured to cycle the device through a predetermined time-

temperature profile via heating and cooling. The difference is a single thermoelectric heating / cooling element. It would have been obvious to one having ordinary skill in the art to modify the invention of claim 18 of 11/450442 to include a Peltier element for each holder to have the capability to cycle each vessel through a predetermined time-temperature profile via heating and cooling.

Referring to claim 18 of the co-pending application 11/651986, it is drawn to a thermocycler comprising a block configured to receive a plurality of sample volumes, the block defining a plurality of segments each configured to receive a respective set of the plurality of sample volumes; and a plurality of thermoelectric devices, where each thermoelectric device corresponds to a respective segment of the block and a respective set of the sample volumes to provide heating and cooling. Thus, all the elements of the instant claim 19 are fully encompassed in claims 18 of 11/651986.

As to claim 26 of the co-pending application 11/651985, it is drawn to a thermocycler comprising a block configured to receive a plurality of sample volumes; a thermoelectric device in thermal communication with the block, the block comprising a plurality of segments and the thermoelectric device comprising a plurality of thermoelectric elements, each thermoelectric element corresponding to a respective segment of the block. Thus, all the elements of the instant claim 19 are fully encompassed in claim 26 of 11/651985.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

11. Applicant's arguments filed 03/21/2008 have been fully considered but they are not persuasive, or moot in view of new grounds of rejection.

Applicant argues that Gordon does not teach or suggest the claimed features "including the two or more thermally insulated segments, two or more devices for heating and cooling the reaction vessel receiving element, wherein each device corresponds to one segment, and wherein the devices are actuated independently of one another to set and maintain different temperatures in two adjacent segments. Instead, for example, Gordon et al specifically state that cooling is "not totally independent for each module" at column 3, lines 51-53 thereof". Examiner disagrees. First, Gordon does teach, as was discussed above, more than one module/segment supporting sample vessels, each module having an individual heating and cooling device. The system also includes a controller which "regulates the electrical current and cooling fluid flows to each module in response to a signal from a temperature sensing element associated with each module"(Col.2, lines 15-20; Col.4, line 45; Col.5, line 55). Second, with respect to the cooling being "not totally independent for each module", as recited in column 3, lines 51-53 of Gordon, Examiner notes that Gordon further states in lines 53 plus that the structure "does allow the simultaneous running of four different temperature profiles each profile being run in the four modules associated with the same manifold". Third, the instant claims do not recite structures configured for "totally independent" heating / cooling. Finally, such thing does not exist due to non existence of total thermal isolation.

Applicant argues that Potter fails to teach thermally insulated segments because of “cold block 25 spanning the entire matrix 24 upon which a plurality of heating elements 22 are provided”. Examiner disagrees. The heat dissipating plate 24 does not preclude modular temperature control via individually actuated heat elements 21, which are also thermally shielded from plate 24 by disc 23 of higher thermal resistance. Examiner also notes that Potter was cited to support the concept of modular temperature control within a single plate (which Potter does teach - see the discussion above), and not the concept of “total” thermal isolation.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Levkovich whose telephone number is 571-272-2462.

The examiner can normally be reached on Mon-Fri, 2 p.m.-10 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797